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ABSTRACT

This study was designed to examine the effects of two factors on the delay behavior of six year old children, a large percentage of whom had not yet attained temporal operations. The subjects consisted of 60 black, first grade children from a lower class urban neighborhood school. The experimental design was a 2x3 factorial with the first factor being the levels of frustration produced by either presence or absence of both low and high valued rewards. This study began with a consideration of the possible positive effects of reward presence, and attempted to dispel the child's frustration by inducing him to think about the rewards in the context of their getting temporally closer. One finding was that subjects given a concrete representation of "time remaining" were able to delay the onset of frustration longer than subjects with no reward present to frustrate them. The results generally support the hypothesis that the presence of rewards is typically frustrating because subjects in the "toys present" control condition waited for shorter periods than subjects in the "toys absent" control condition. (Author/BW)

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COGNITION AND FRUSTRATION IN DELAY OF GRATIFICATION[1]

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Cognition and Frustration in Delay of Gratification

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Mischel and Ebbesen (1970) recently embarked on a research program investigating the relationship of cognitive and attentional variables to self-imposed delay of reward. Employing a paradigm in which the subject is required to wait a period of time for a highly valued reward , but may terminate the delay period at any time for a low valued reward, these investigators found that waiting time is significantly decreased when the rewards are present for the subjects to attend to. Mischel viewed these findings as congruent with a frustrative nonreward theory (Amsel, 1962) since the presence of rewards led to shorter waiting times than their absence.

While Mischel's analysis is important in that the physical presence of rewards may result in more frustration than incentive for preschool subjects, the method of removing rewards to increase delay has its drawbacks. From a practical standpoint it is not always possible to separate attention to the reward from the process of obtaining it, as for example, when a child must work with an adult to obtain social reinforcement from her. Likewise, from a cognitive-developmental viewpoint, as the child's representative memory matures an absent reward may be as frustrating as a present one. Thus it is of considerable interest to determine how developing cognitive processes enable the child to overcome frustration while a reward is present to his attention,either mentally or physically.

Following this rationale, Mischel, Ebbesen, and Zeiss (1972) tested the hypothesis that distraction from a physically present reward would result in increased waiting times. Their preschool subjects who had been instructed to distract themselves from the rewards by thinking of other pleasant things or by playing with toys, achieved significantly longer delay times than subjects not so instructed. Singer's (1961) finding that children with higher spontaneous fantasy levels wait longer than those with lower fantasy levels also provides support for the contention that distraction from the frustration of nonreward, whether externally or internally imposed, enables a child to delay with less difficulty.

It should be obvious, however, that complete distraction from the goal (i.e., forgetting about it, leaving the field), particularly in a setting where the child must do something (i.e., wait quietly or work) to obtain the goal, will result in a failure to reach the goal simply because the child will find something more interesting to do. It is precisely for this reason that the cognitive-analytic theorists (Freud, 1959; Rapaport, 1967) have conceived of effective delay behavior as the ability to overcome frustration <u>while</u> maintaining the behaviors on which the reward is contingent. We assume, with these theorists, that in order to accomplish a delay a child must frequently remind himself of the contingency imposed upom himself, and in doing so, logically, he must recall the reward for which he is waiting. Thus a delay of gratification situation imposes a conflict on the child: in order to maintain his behavior he must recall the purpose for waiting, but in doing so, he is frustrated by not having the reward immediately.

The paradox posed may be resolved by examining the phrase "thinking about rewards". We assume that normal adults think about rewards in the contexts of either 1) not having them immediately, or 2) obtaining them soon. Thinking about rewards in the first context should produce frustration, while doing so in the second should produce an incentive effect. Thus inducing subjects to think about rewards in the second context should facilitate rather than impede delay behavior. The theoretical hypothesis underlying the present experiment is that perception of a decrease in temporal distance from goal attainment will be accompanied by increments to the motivation to continue waiting. This hypothesis is based on the assumption that a goal becomes more attractive the closer one is to it (either spatially or temporally) which has received experimental verification in the work of Hindle (1951) with adults, and Mischel, Grusec, and Masters (1969) with older children.

In a typical delay of gratification situation where rewards are in the child's view but are not available for him, the frustrating context mentioned above is immediately given by the situation. It is proposed, however, that the context of "obtaining rewards soon" requires mental operations which may not be equally available to children of all ages. That is, if a child has not yet attained temporal operations (c.f. Piaget, 1971) he should not be capable of making certain deductions about time from the information at hand. Specifically, he should not be able to deduce that the time remaining before goal attainment is getting shorter with each successive moment he waits. If Piaget's analysis of the growth of temporal operations holds, very young children should not consider that they are getting temporally closer to the goal unless some concrete (spatial) representation of the passage of time is available.

The present study was designed to examine the effects of two factors on the delay behavior of six year old children, a large percent of whom have not yet attained temporal operations (Lovell and Slater, 1960). The first factor, the presence or absence of rewards in the delay situation, was analogous to conditions utilized by Mischel and Ebbesen (1970). It was expected that their finding of greater delay with rewards absent would be replicated.

For the second factor, provision of a concrete time-aid (a 15 min. sandglass) and instructions regarding its relevance to goal attainment were varied. One third of the subjects were provided with this spatial representation of the time remaining during their delay period and were given prior instructions about its relevance. Another third of the subjects were presented with the glass but were given no instructions, while a final third were shown no time-aid at all. Predictions were that providing the time-aid plus instructions for the child would yield longer delay times than not doing so, since this condition would induce the subject to think about the rewards in the context of their decreasing temporal distance. The time-aid, no instructions condition was included as a control for possible distracting effects of the glass. No differences were expected between this and the no time-aid conditions. Finally, it was predicted that provision of time-aid plus instructions when rewards were present would yield the longest delay times of all since the cognitive instructions were expected to convert a frustrating situation into a more hopeful one.

Method

Subjects

Sixty black, first grade children (mean age of 78.2 mo.), from a lower class urban neighborhood school served as subjects. Assignment to the six treatment conditions described below was random with the restriction that each group contain 5 females and 5 males.

Apparatus

A 6' X 5' portable room was used for the delay situation. In the room were a small chair, a table on which to place the toys and/or timer, and a buzzer. An 18" sand glass calibrated to 15 min. (± 17 sec.) served as the timer.

Experimental Conditions

The experimental design was a 2 X 3 factorial with the first factor being the levels of frustration produced by either presence (high frustration) or absence (low frustration) of both the low and high valued rewards. This factor was crossed with three conditions varying in relevance of the timer and instructions. In the first of these (Time instructions), the timer was displayed before the child while he waited, and he was given prior instructions about its relevance to how long the waiting period would be. The second condition (Timer Control) was a control for any distracting effects the timer's presence might have, and differed from the first condition only by the omission of instructions. A third condition (Control) replicated Mischel and Ebbesen's (1970) experiment in that neither timer nor instructions were used.

Procedure

Toy ratings. Six toys (a doll, firetruck, coloring book, sponge ball, mickey mouse, and beanbags) were placed in a semicircle on a table

in front of the subject. After each was described to him, he was asked:

"Out of all these toys here, which one do you like the very best? Point to your favorite."

The experimenter noted the choice, then continued:

"I'll put this toy on the side, and I'd like you to look at the toys left. Out of those left, which do you like the best?"

The experimenter continued this process until only one toy was left, then took the first and fifth ranked toy and asked the subject to follow her into the portable room. The toy rated sixth was not used because it was typically the sex-role inappropriate one for boys (e.g., the doll).

Experimental Instructions. The subject was seated in the small chair facing the table on which the two toys were placed about 2' apart at the subject's eye level. He was told:

"Now here is what I would like you to do. I'm going to have to go out of this room for awhile, and I would like you to sit real tight here in this chair. Do you think you can do that? No see this button down here? When I press it a buzzer rings. See? While I'm out of the room, if you want to bring me back all by yourself, all you have to do is press this button and I'll come back. Let's practice and see if you can bring me back; I'll go outside, and when I get out there, you press the button, O.K.?"

The experimenter then left the room, waited for the buzzer to sound, and returned immediately. She then repeated this procedure; each subject was given two practice trials in bringing the experimenter back into the room. The experimenter then picked up the two toys and gave the following contin-

gency instructions:

"Now I have to go out of this room back to my desk, and here is what you can do. If you wait for me to come back by myself, without pressing the button, you can play with this toy (the high valued one). But if you don't want to wait that long, or if you get tired of waiting, you can press the button and bring me back by yourself. But then if you do that, you can only play with this toy (the low valued one) but not with the other one."

The experimenter then consulted a paper to determine which experimental condition the subject was assigned. For one control condition (Control) the above instructions were then repeated in a paraphrased form. For the second control condition (Timer Control) the 15 min. timer was placed before the child and he was told:

"Did you ever see one of these? It's called a sand glass. See how it works? All this sand up top keeps falling to the bottom, and pretty soon all the sand will fall through and none will be left in the top.* While you're sitting here you may look at it."

The contingency instructions were then repeated. For the third condition (Time Instructions), subjects were given the same instructions as above, up to the asterisk, and also told:

"And here is something important: if you wait until all the sand has dropped to the bottom, that is when I'll come back by myself, and that is when you can play with this toy (the high valued one); but if you don't want to wait for all the sand to fall down, you can press the button and make me come back; then you can play with the other toy."

All subjects were then asked several questions to determine if they under-

stood the two possible outcomes. Finally, half of the subjects in each condition had the toys placed before them, and were told not to play with them while they were alone. The remaining subjects were shown the toys once more before the experimenter took them from the room. Thus the three time-aid conditions were crossed with two conditions in which the toys were either present or absent. The experimenter operated a stopwatch upon leaving the room. When either the subject rang the buzzer or the 15 min. elapsed, the experimenter stopped the watch, noted the time, and re-entered the room. For all subjects an inquiry was then made regarding memory of the contingencies. Four subjects were eliminated; two because they did not recall the contingencies at this time, one because he had to visit the lavatory and one because she had inadvertently been allowed to see another subject go through the entire process. Each child was then allowed to play with the chosen toy for approximately 5 min. before being returned to his classroom.

Results

A 2 (Frustration level) X 3 (Time-aid) analysis of variance on the mean waiting times in seconds demonstrated that both main effects and interaction were significant. The significant main effect for frustration level ($F = 8.01$, $df = 1/54$, $p < .01$) supported the hypothesis that the presence of toys (high frustration) would result in shorter voluntary delay times. The significant main effect for the time concept aid factor ($F = 4.60$, $df = 2/54$, $p < .05$) was further analyzed with Newman-Keuls comparisons of the means which revealed that the main effect stemmed from the significantly longer waiting times of the children in the timer plus instructions conditions ($\bar{X} = 690.5$ sec.) compared to the timer control ($\bar{X} = 432.4$ sec.) and control conditions ($\bar{X} = 452.0$ sec.).

Finally, the significant interaction ($F = 3.96$, $df = 2/54$, $p < .05$) primarily reflected the longer waiting times resulting from the high frustration, time instructions group compared to the other high frustration groups and to the low frustration, time instructions group. This interaction is displayed in Fig. 1. Newman-Keuls comparisons of the cell means

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Insert Figure 1 about here

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indicated that the two control groups in the presence of reward waited significantly less than the other four groups ($p < .01$ for all comparisons). In addition, the high frustration group which received time instructions waited significantly longer than all of the other five groups (p .05 for all comparisons). Inspection of the data indicated that not one subject in either of the high frustration control groups waited the entire 15 min., while six of the ten subjects in the high frustration, time instructions group did so. Under low frustration, however, five, five, and six subjects (Control, Timer Control, and Time Instructions groups, respectively) waited the entire 15 min..

Discussion

Previous analyses of the effects of reward presence or absence in a delay situation have tended to stress only the frustrating effects of reward presence, and have concluded that distraction from "thinking about rewards" was the optimal cognitive condition for production of long delay times (Mischel, Ebbesen, and Zeiss, 1972). The present study began with a consideration of the possible positive effects of reward presence, and attempted to despel the child's frustration by inducing him to think about the rewards in the context of their getting temporally closer. This

was achieved by provision of a concrete representation of time and relevant instructions to aid the subject's perception of a decreasing temporal distance from the goal. An anticipated argument, that the time glass may have served as a distractor, is discounted by the fact that the presence of a timer in a control condition yielded delay times similar to those of a no-timer condition, in both the high and low frustration conditions.

The finding that subjects given a concrete representation of "time remaining" delayed longer than subjects with no reward present to frustrate them indicates that thinking about toys in a positive context facilitated waiting. It should be noted that, in general, our results support Mischel's (1971) hypothesis that the presence of rewards is typically frustrating because subjects in the toys present control conditions waited for shorter periods of time than subjects in the toys absent control conditions. However, the generality of any statement about the frustrating effect of reward presence must be qualified by our finding that when given instructions designed to enhance perception of the endpoint, children delayed longer regardless of reward presence, and maximally when they were present. The latter finding is particularly interesting since it demonstrates that the presence of rewards enhances delay behavior when the appropriate cognitive aids for coping with frustration are available to the child.

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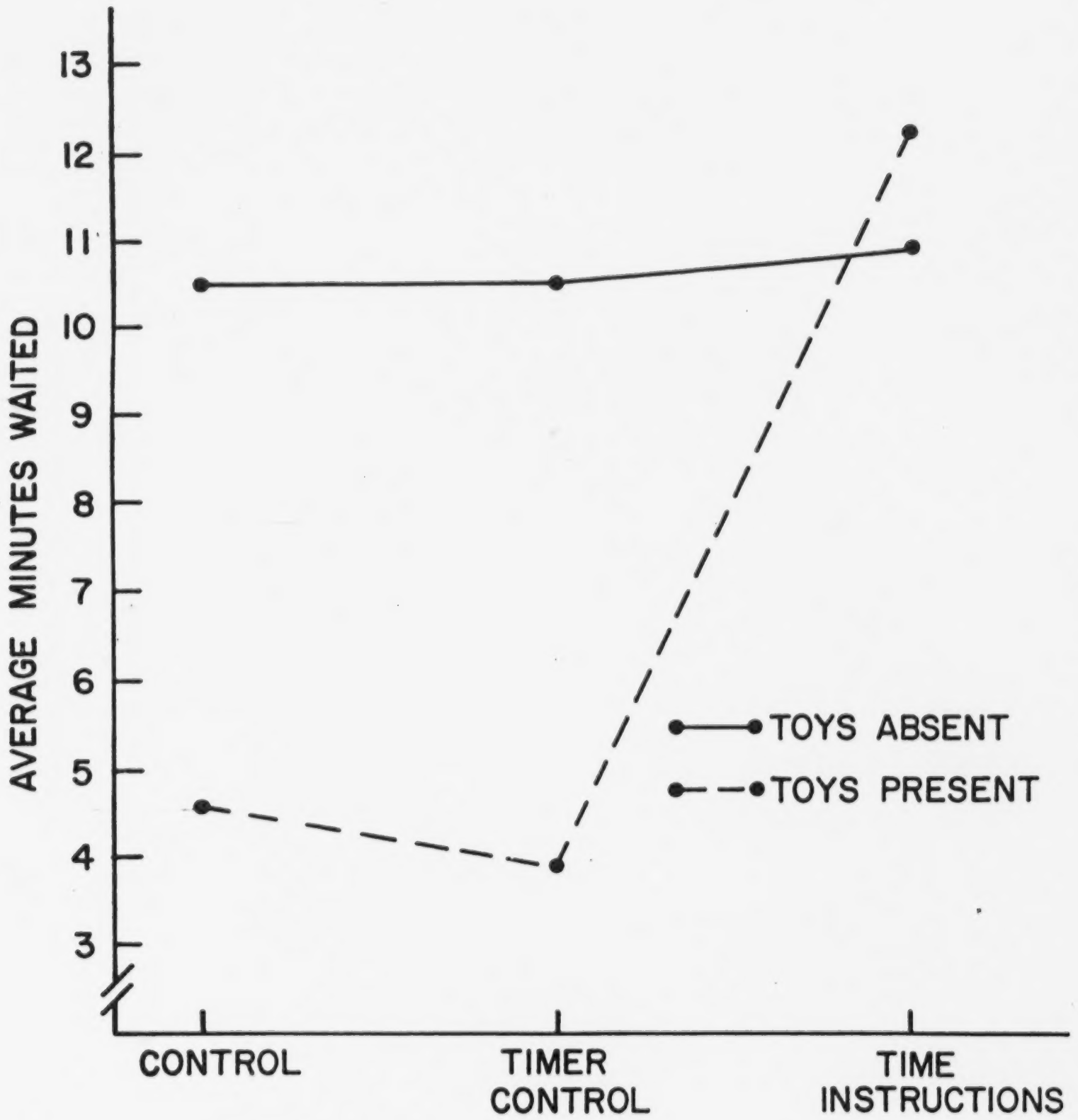

Fig. 1 Average time delayed by subjects in high (toys present) and low frustration (toys absent) conditions under three conditions varying in relevance of timer.